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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/562,612

06/09/2006

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246.1002

4578

20311 7590 03/16/2009
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EXAMINER

YUSUF, MOHAMMAD I

ART UNIT

PAPER NUMBER

4177

MAIL DATE

DELIVERY MODE

03/16/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/562,612	Applicant(s) ARNS ET AL.	
	Examiner MOHAMMAD YUSUF	Art Unit 4177	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-38 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-38 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/05/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

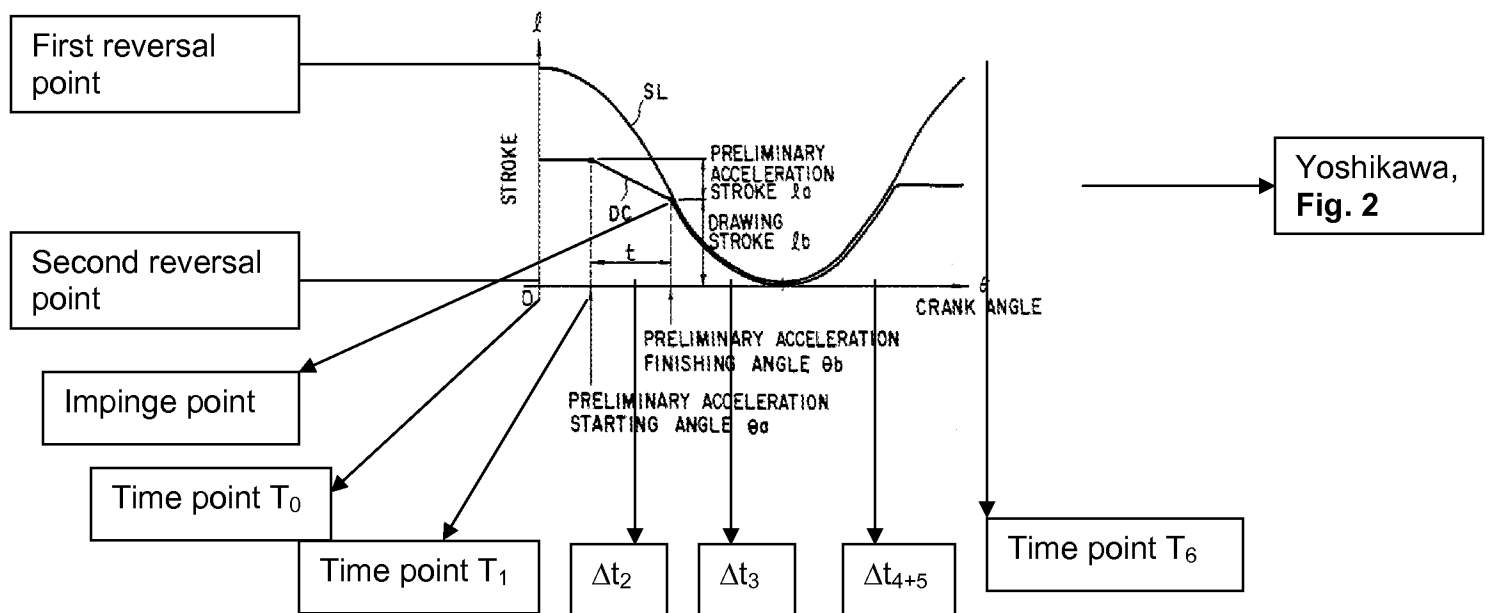
2. Claims 20-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshikawa (US 5,339,665, cited in the applicant's IDS).

In regard to **claim 20**, Yoshikawa discloses:

A device (fig. 1, control unit body 14) for controlling a drawing process in a transfer press (title), with two tool parts (fig. 1, slide 10 and die cushion 4) which act in opposition to one another and between which a workpiece (fig. 1, W) to be deformed is held and of which one tool part (fig. 1, slide 10), in particular a negative mold (fig. 1, upper mold 23 attached to slide 10), can be moved between two reversal points (fig. 1, slide 10 moves between two points), of which tool parts the first is assigned to the commencement of a work cycle (fig. 2, shows the stroke cycle SL of slide 10 and attached upper mold 23), by a mechanical crank mechanism (fig. 2, crank angle theta of the horizontal axis of the graph is read from a crank mechanism) driven at a constant rotational speed (fig. 2, between each infinitesimally small time segment the rotation speed is inherently constant), and of which the second tool part (fig. 1, die cushion 4), in particular a drawing cushion (fig. 1, die cushion 4), is connected via a piston rod (fig. 1, 7a) to the piston (fig. 1, 7b) of a hydraulic differential cylinder (fig. 1, hydraulic cylinder

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7), wherein the movement of the piston is controlled by the supply of pressure medium into a first chamber (fig. 1, 7₁) and by the discharge of pressure medium out of a second chamber (fig. 1, 7₂) of the differential cylinder, and in which, during a first time segment (fig. 2, Δt_2 shown below in the attached figure) which extends within a range delimited by the first and the second reversal point (shown below), the rod-side face of the piston is acted upon by a pressure (fig.1, pressure in chamber 7₁) which is sufficiently high to



accelerate the second tool part (fig. 2 the path of die cushion 4 is DC, shown above) in such a way that, when the first tool part (fig. 2, the path of slide 10 is SL, shown above) and the second tool part impinge one onto the other (fig. 2, impingement point show above), both tool parts move at virtually the same speed (the speed of DC and SL are nearly same), and in which a controllable throttle arranged between a bottom-slide chamber of the differential cylinder and a tank determines the pressure in the bottom-side chamber (fig.1, servo valve 22, between second chamber 7₂ and the tank below

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pump 8, controls the pressurized oil flow in to chamber 7₂), wherein, in a second time segment (fig. 2, Δt_3 shown above) which follows the first time segment (Δt_2) and extends until the second reversal point (fig. 2, shown above) is reached, the rod-side face of the piston (fig. 1, chamber 7₁) is acted upon by a second pressure which is lower than the pressure during the first time segment (fig. 1 and column 6, lines 3-24, the pressure in chamber 7₁, is increased by activating servo motor 22 in order to gain preliminary acceleration of the die cushion 4, shown above in first time segment Δt_2 , but when the slide 10 contacts die cushion 4, the servo motor 22 is stopped. Now in the second time segment Δt_3 , the die cushion is moved down, drawing stroke, by the slide 10 and the volume inside chamber 7₁ is increasing, which in turn reduces the pressure inside).

In regard to **claim 21**,

Yoshikawa discloses: that the rod-side face of the piston (rod-side face of the piston is also the chamber 7₁ and both face the same pressure) is acted upon by the first pressure again in a third time segment of the work cycle, which third time segment commences with the reversal in the direction of movement of the crank mechanism and ends at the latest at the time point in which the crank mechanism reaches the first reversal point (the third time segment of the work, Δt_{4+5} , where the slide 10 of the crank mechanism reverses back to first reversal point at time point T₆, is basically the reversal of the initial work, illustrated and shown in the attached fig. 2 above, thus the first pressure is again applied in chamber 7₁ during the third time segment).

In regard to **claim 22**,

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Yoshikawa discloses that the rod-side face of the piston (rod-side face of the piston is also the chamber 7₁ and both face the same pressure) is acted upon, further, by the second pressure in a third time segment of the work cycle, which third time segment commences with the reversal in the direction of movement of said piston and ends at the latest at the time point at which the crank mechanism reaches the first reversal point (as shown above in attached fig. 2, in the reverse path, the crank mechanism goes back to first reversal point. Yoshikawa does not explicitly disclose the second pressure being applied again in the reverse path, but in order to bring the die cushion 4 back to ready state for the next drawing process, second pressure need to be applied again. In the event applicant asserts that a second pressure is not used in the reversed path, applicant is referred to the below 103 rejection under Yoshikawa).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 22-24, 26, 29-31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa (US 5,339,665) as applied to claim 20 above.

In regard to **claim 22**,

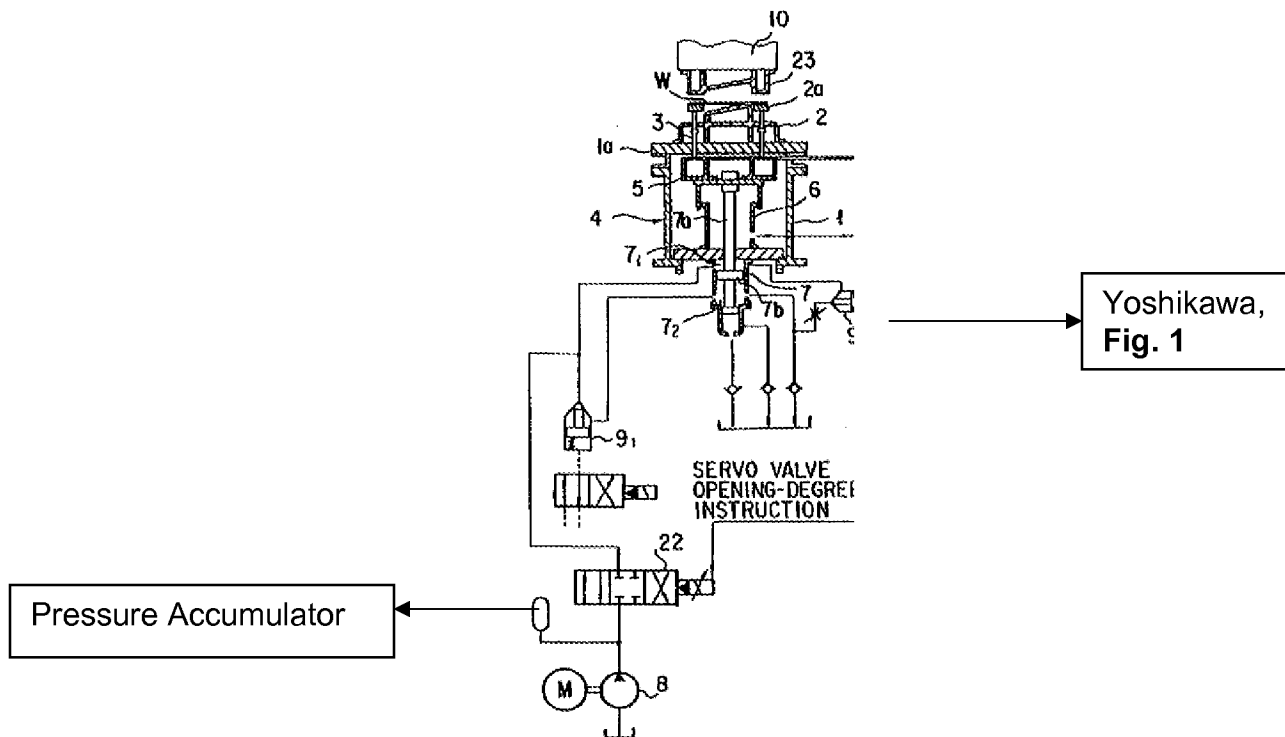
Yoshikawa does not explicitly disclose that the rod-side face of the piston (rod-side face of the piston is also the chamber 7₁ and both face the same pressure) is acted upon,

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further, by the second pressure in a third time segment of the work cycle, which third time segment commences with the reversal in the direction of movement of said piston and ends at the latest at the time point at which the crank mechanism reaches the first reversal point (as shown above in attached fig. 2, in the reverse path, the crank mechanism goes back to first reversal point. However, it would have been obvious for one having ordinary skill in the art at the time the invention was made to provide a second pressure being applied again in the reverse path in order to bring the die cushion 4 back to ready state for the next drawing process as evidenced by Nagao et al., US 6,205,828, fig. 11, where at stage S15-S16 pressure is applied again to restore the piston to its original position).

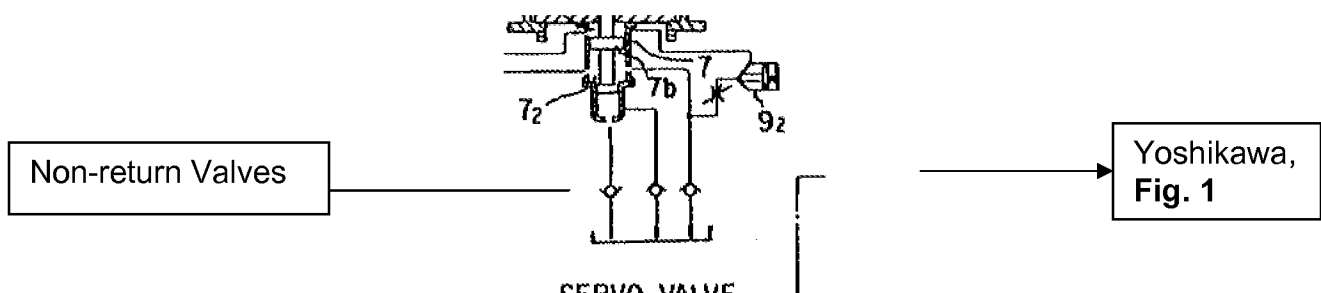
In regard to **claim 23**,

Yoshikawa does not disclose two pressure accumulators of which one is charged to the first pressure and the second is charged to the second pressure and wherein the action of pressure medium upon the rod-side chamber at the differential cylinder takes place from the same pressure accumulator which is charged to the pressure provided for the respective time segment. Yoshikawa only discloses one accumulator (shown below with the attached fig. 1), one pump (pump 8) for both pressure chambers 7_1 and 7_2 . It would have been obvious for one having ordinary skill in the art at the time the invention was made to provide separate accumulator and pump for the each chambers, because this would provide effective control over fluid flow and pressure in each chamber and since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.



In regard to **claim 24**,

Yoshikawa discloses bunch of non-return valves in fig. 1 connected to each chambers shown below in the attached fig. 1. It would have been obvious for one having ordinary skill in the art at the time the invention was made to incorporate more non-return valves into modified Yoshikawa's apparatus between the accumulator and chamber 7₁, because it would protect the fluid from accidentally flow in the reverse direction.



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In regard to **claim 26**,

Modified Yoshikawa discloses a second pump as explained in rejection of claim 23 above.

In regards to **claims 29 and 30**,

Yoshikawa discloses logic valve 9₁, or switch valve, that is between the accumulator and the chamber 7₁, and controls the fluid flow communication (column 4, lines 35-37).

In regards to **claim 31**,

Yoshikawa discloses servo valve 22, or proportional valve, that is between the accumulator and the chamber 7₁, and controls the fluid flow pressure (column 4, lines 33-35).

5. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa (US 5,339,665) as applied to claim 24 above, and in view of Janos et al. (US 5,966,981).

In regard to **claim 25**,

Modified Yoshikawa does not disclose a proportional valve, but discloses a servo valve (22) that controls the flow of pressure from accumulators to the chambers (7₁ and 7₂) and from chambers to the tank (below pump 8). It would have been obvious, absent a statement of criticality, for one having ordinary skill in the art at the time the invention was made to substitute the servo valve with a proportional valve, because they were art recognized well known functional-equivalents for controlling fluid flow, as evidenced by Janos et al. in column 8, line 10.

6. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa (US 5,339,665) as applied to claim 26 above, and in view of Lucas et al. (US 4,721,028).

In regard to **claim 27**,

Modified Yoshikawa discloses of hydraulic pump (Yoshikawa, 8), but does not disclose the type of the pump. However, Lucas et al. discloses a control system for hydraulic press (title). In his apparatus, Lucas et al., discloses a fixed displacement type pump 102 (column 4, lines 31-34) and there are cartridge valve 2 (column 4, lines 35-37) coupled to the pump 102 to control the output or fluid flow from the pump. A cartridge valve is a cut-off valve. It would have been obvious for one having ordinary skill in the art at the time the invention was made to use fixed displacement pumps and cartridge valves disclosed by Lucas et al. into modified Yoshikawa's apparatus, because this would give an easier control of the fluid flow going to the cylinder chambers via accumulators.

7. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa (US 5,339,665) as applied to claim 26 above, and in view of Kohno (US 6,085,520).

In regard to **claim 28**,

Modified Yoshikawa only discloses a hydraulic pump (Yoshikawa, 8) used in his apparatus, but does not disclose the type of the pump. However, Kohno discloses a

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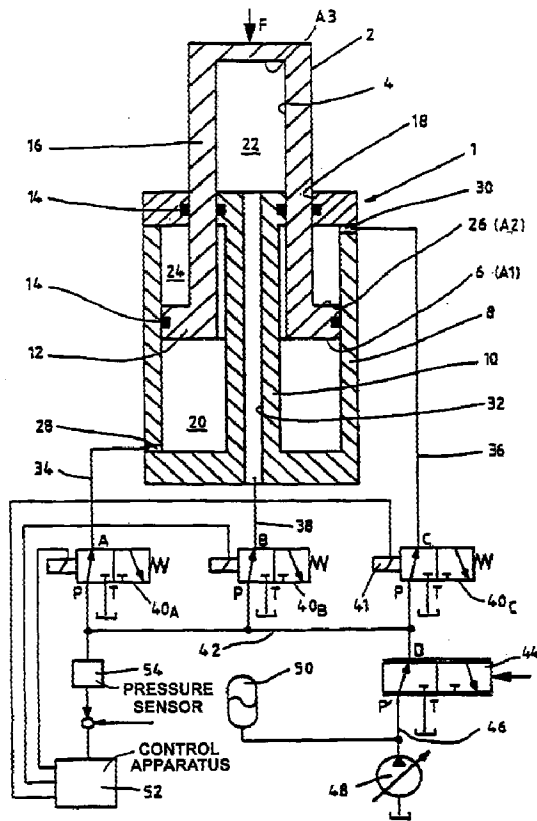
driving device for presses, where a variable-displacement pump is used for fluid supply to an accumulator (column 8, lines 21-25). It would have been obvious for one having ordinary skill in the art at the time the invention was made to use variable-displacement pumps as disclosed by Lucas et al. into modified Yoshikawa's apparatus, because this would give an easier control of the fluid flow going to the cylinder chambers via accumulators.

8. Claims 32-33 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshikawa (US 5,339,665) in view of Janos et al. (5,966,981) as applied to claim 25 above, and further in view of Dantlgraber (US 6,145,307, cited in the applicant's IDS).

In regard to **claim 32**,

Yoshikawa does not disclose that the bottom-side face of the piston is divided into two parts. However Dantlgraber discloses a hydraulic cylinder acting against a load (abstract), where the piston has two-faced (A1 and A3; figure is copied below) bottom side and different pressure acts on them (each cavity 20, 24, and 22 are connected to a proportional valve 44, which is used to control the pressure in the cavities and can be used to select different pressure in order to advance the movement of the piston; column 5, lines 55-63; also column 1, lines 5-15). It would have been obvious for one having ordinary skill in the art at the time the invention was made to modify Yoshikawa's hydraulic cylinder into a multi-cavity hydraulic cylinder as suggested by Dantlgraber (shown below in the copied figure), because it would provide minimum energy

consumption and minimum expense in terms of device technology (Dantlgraber, column 2, lines 1-6).



Dantlgraber,
single figure

In regard to **claim 33**,

Dantlgraber discloses that the piston (2) of the differential cylinder (col 2, lines 47-49) is provided with a bore (inner bore 4), into which a piston (center column 10) fixed with respect to the housing engages, and that the supply of pressure medium to the inner bottom-side chamber (22) formed from the bore (inner bore 4) and the piston (center column 10) fixed with respect to the housing takes place via a duct (port bore 32) in the piston (center column 10) fixed with respect to the housing.

In regard to **claims 35 and 36,**

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Dantlgraber discloses a control apparatus, which can control the pressure distribution in the cavities 22, 24, 20 separately and can fluctuate the pressure in them in different time periods (see column 5, lines 46-54).

In regard to **claim 37**,

Modified Yoshikawa discloses hydraulic machine (figs. 1 and 4, hydraulic cylinder 7) where the controller (fig. 4, 29) controls the tank pressure to move the die cushion down from the reversal point (shown above in paragraph 2, in the attached figure under the rejection of claim 20) at T_0 to T_1 .

In regard to **claim 38**,

Dantlgraber discloses nonreturn valve (distributing valves 40b, which has solenoid valve for restriction flow return, column 4, lines 1-2) that is between accumulator 50 and line 38 leading from the hydraulic machine 48 to cylinder 1.

9. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over the references set forth above in paragraph 8 as applied to claim 32 above, and further in view of Sunada (US 5,435,166).

In regard to **claim 34**,

Yoshikawa discloses an electric motor (fig. 4, main motor 32) drives the pumps (figs. 1 and 4, pilot pump M) and the hydraulic machine (fig. 4, hydraulic pressure generator 28) via a common shaft (fig. 4, main shaft, next to encoder 31).

Modified Yoshikawa does not disclose a flywheel mask. However it would have been obvious for one having ordinary skill in the art at the time the invention was made to

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incorporate a flywheel mask into modified Yoshikawa, because it would reduce the energy for the press operation and also power consumption as exemplified by Sunada in column 7, lines 16-18.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MOHAMMAD YUSUF whose telephone number is (571)270-7487. The examiner can normally be reached on Monday-Friday 8:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dana Ross can be reached on 571-272-4480. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dana Ross/
Supervisory Patent Examiner, Art Unit 3725

/MY/

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